DOCUMENT RESUME

ED 245 701 IR 050 773

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TITLE Training Information Consumers: Today's Challenge.
PUB DATE Mar 83
NOTE 11p.; Paper presented at the Annual Conference of the National Federation of Abstracting and Information Services (25th, Arlington, VA, Febraury 27-March 2, 1983).
PUB TYPE Information Analyses (070) -- Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Business; *Databases; Futures (of Society); Information Scientists; Input Output Devices; *Online Systems; *Technological Advancement; *Training Methods
IDENTIFIERS *Database Producers; End Users; *Information System Users; Online Search Skills

ABSTRACT

The revolution in the information environment caused by new technology is making the training of information consumers a major challenge for publishers of business-targeted databases and vendors of online systems. Research conducted by Data Courier in 1981 and 1982 suggests that online searching by information consumers will continue to increase. Surveying the emerging discipline of information consumer training uncovers two clear challenges. First, relatively few online systems and only a handful of database publishers have tried training information consumers to tackle online searching. Second, no two organizations have tried exactly the same thing. Recent information consumer training projects have used (1) in-person training; (2) user manuals; (3) computer-assisted instruction; (4) transparent systems; and (5) simplified systems. The major impact of advanced software technology will be to make the communicating terminal a household concept, and one of the principal tasks for database publishers, timesharing companies, and information specialists will be dealing with the confusion that comes with rapid change. Helping information consumers develop a thorough understanding of online systems is the task of the future. (DMC)

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TRAINING INFORMATION CONSUMERS: TODAY'S CHALLENGE

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THE CHANGING ENVIRONMENT

A revolution has swept through offices during the last five years. Communicating terminals, automated office systems, mini- and microcomputers, and hundreds of other technological innovations have changed the way information moves within our society.

There are no longer simple answers to the questions of who has information, who finds it, and who uses it in the decision-making process. The searching of online bibliographic systems, for example, traditionally has been the domain of the information specialist. Today, the person with a question has new avenues for getting the answer, and the librarian's role is changing in the process.

The end user or information consumer -- the person with a question -- is an elusive species. With the proliferation of terminals in a broad range of departments, this ultimate consumer of information is now technically able to seek the answers directly.

One prediction is that in the future "professionals will tend to support problem-solving and decision-making activities, rather than delegating this task to information specialists."[1]

But what about the information specialists? This revolution is affecting them directly, and the impact is favorable. Information specialists in many organizations already are able to concentrate on more complex data collection than in the past. Daily, more people with terminals in their departments are conducting background information searches.

The information specialist is emerging as a consultant -- a guide to the available electronic and print resources, a person to call upon for searches in unfamiliar territory.

Charles Meadow, now Dialog's Manager of Customer Services, acknowledges that the revolution is creating a need to train a broader range of professionals.[2] As organizations get access to easier-to-use systems, professionals in a range of functions want the information directly. Thus, a demand is beginning to swell for ways to make the systems work for a variety of new users.

Carlos Cuadra, the former General Manager of System Development Corporation (SDC) Search Service and now President of Cuadra Associates, noted in the 1980 Miles Conrad Memorial Lecture that most information consumers do not need access to dozens of databases.[3] Their needs are fairly narrow. Consequently, professionals outside the library want information from a manageable number of databases.

IR050173

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

By applying specific subject expertise in the research process, the professional will probably obtain satisfactory results from searching online. But basic training and support must be provided to accomplish this.

Research conducted by Data Courier in 1981 and 1982 suggests that online searching by information consumers will continue to increase. The catch is that a negative first experience may alienate some information consumers from specific systems or databases. Thus, the stakes are high for the online systems vendors and for publishers of business-targeted databases.

THE CHALLENGES

Surveying the emerging discipline of information consumer training uncovers two clear challenges. First, relatively few online systems and only a handful of database publishers have tried training information consumers to tackle online searching. Second, no two organizations have tried exactly the same thing.

Little consensus exists about how to train information consumers. However, three conclusions about online training for information consumers are of interest:

- In-person user training is notoriously difficult to schedule and very costly
- No one is sure at what level to target the information. Shoot too low and the informed people in the audience feel patronized; aim too high and you lose them
- There are more information consumers than anyone ever imagined. Data Courier's research shows that professionals in virtually all functional departments of Fortune 1000 companies have access to terminals. The logistics of reaching so many people with such diverse interests makes online training an unsolved mass communication problem

In the remainder of this paper, I will examine recent instances of information consumer training and conclude by commenting on the outlook in light of the challenges awaiting us.

THE IN-PERSON TRAINING APPROACH (BUSINESS PEOPLE)

The LEXIS service offers full-text legal databases online. Produced by Mead Data Central, LEXIS has over 10 years' experience in training attorneys and librarians in law firms.

The earliest LEXIS training sessions lasted two days and were conducted in a retreat setting, ostensibly away from the bustle of the firms' offices. Because of cost and practicality, the training later evolved to one six-hour day of in-person instruction. Eventually, the format was supplemented with videocassettes produced by the Mead staff.

At this time, in-person training is handled in two-hour sessions. Users may attend training sessions in the firm's offices or at 20 strategically located LEXIS permanent learning centers.

According to George Relles at LEXIS, more than 40,000 LEXIS users received in-person training last year. Mead also offers online tutorials or self-paced manuals, and telephone customer service. In the future, some form of computer-assisted instruction is likely to be offered.

The Congressional Research Service (CRS) illustrates a pattern similar to that followed by LEXIS.[4] In 1974, CRS began training Congressional staff to use the SCORPIO system. One-on-one tutorials were held in Congressional offices. By 1978 group training evolved. Each user attended three two-hour sessions of 10 to 12 students. The group sessions included lectures, workbooks, and hands-on searching. CRS tried to give students about three hours of hands-on time.

Within the last two years, CRS has switched to a computer-assisted instruction format using the protocols of Control Data Corporation's PLATO system. The section on computer assisted instruction will discuss the use of PLATO.

ITT Dialcom offers automated office services principally to governmental agencies and corporations. The heart of Dialcom's services is an electronic mail system, for writing, sending and filing memoranda, reports, and other documents over the Primecom system. The firm has been in the electronic mail business for about 10 years and has been wrestling with training problems throughout that period.

When an organization signs a contract, Dialcom conducts one or more training sessions at the client's offices. The sessions are limited to 50 users and designed around using the system, rather than formal course work. The key to Dialcom's success, according to Chris Brown, Executive Vice President for Marketing, is an easy-to-use system that is nearly foolproof.

Once service is set up and basic instruction completed, a contact person is named in the organization. Future training, troubleshooting and special services are coordinated through the contact, an approach which greatly reduces the number of calls and problems flowing into Dialcom customer service offices.

THE IN-PERSON TRAINING APPROACH (SCIENTIFIC AND TECHNICAL PROFESSIONALS)

Professionals in scientific and technical areas need access to databases with very specialized emphasis. Information specialists have been the leaders in training information consumers to search technical files.

User Services Coordinator for PsycINFO, Susan Marleski, reported on a four-hour workshop for psychologists[5] given as part of a continuing education program sponsored by the American Psychological Association. Participants were taught simple subject and author searches of the PsycINFO database, utilizing the Dialog system. Most had their first hands-on experience searching online.

A series of special three-day workshops for science educators held between 1977 and 1979 was designed by Erica Scurr and Diane K. Yoder.[6] The purpose of the workshops was to teach online searching skills to educators who could then integrate the concept into their curricula.

Some searchers are conducting in-person training programs for information consumers within their organizations. Oregon State University (OSU) developed a pilot course in online bibliographic searching for upper division and graduate students in the biological sciences.[7,8]

Students were taught how to search the BioSciences Information Service (BIOSIS) database because of the complexity of the file and its relevance to the students' interests. A workbook, An introduction to Online Access to BIOSIS Previews Via the Lockheed Information Retrieval Service was developed to supplement Dialog and BIOSIS documentation. It consisted of four parts:

- A brief introduction to the organization of online databases and systems
- An introduction to Dialog commands with a number of exercises
- A discussion of the organization of the BIOSIS database
- A final chapter on search strategy models and techniques

After the pilot course was completed, an introductory section of search exercises was added to the course outline. Because the students' evaluation of the program was favorable, OSU is continuing it.

In another industry setting, 15 organic research chemists at Kodak Research Laboratories attended in-person training conducted by Judith Haines.[9] They were trained to search Chemical Abstracts' (CA) files on Dialog.

In September 1979, Haines conducted two one and one-half hour training sessions for the chemists, covering logon protocols, Dialog commands and the structures of CA Search and Chemname databases. Handouts included logon charts, the Pocket Guide to Dialog Commands, sample CA search and Chemname searches, and practice questions for the corresponding ONTAP files. After these sessions, a Dialog representative presented a session on chemical databases.

Haines monitored usage for one year after the training. As a result of the pilot course, she suggests the following:

- Training is more successful when participation is voluntary
- Equipment needed for training must be in place at the training site when the program begins
- Searchers need easy access to equipment after training is completed

- A group of short training sessions on the basics of searching is more desirable than a long intensive workshop

In another training project, 12 graduate students at Ohio State University were taught search techniques to prepare them for jobs in natural resources requiring information handling skills.[10,11] Their training was integrated into the curriculum of the graduate course "Research Methods in Natural Resources."

First the students were taught to search relevant printed indexes. The next step was to learn about the online counterparts to the printed indexes. Three lab sessions covered the mechanics of searching, search exercises, and an explanation of two relevant databases, Agricola and National Technical Information Service (NTIS). By the end of the course, all the students were capable of conducting an online search alone or with some coaching.

USER MANUALS

Some efforts have been made to design printed guides as substitutes for formal training. A project to design a manual to teach science students online searching was undertaken by Scurr and Yoder.[6] The 250-page manual, CA Search for Beginners, begins with an introduction to online searching, including a discussion of print vs. online, Boolean operators, and truncation.

The next section covers the command language of one online system. (Different versions of the manual exist for Dialog, BRS, and Orbit.) Finally, the manual covers content, structure and format of CA Search. The largest portion of the manual illustrates 20 searches in question-and-answer format. A student searches online on CA's reduced rate files on the various systems (e.g., ONTAP).

The author concluded that about 20 hours is needed to complete the course -- 12 hours to study the manual, four hours to develop search strategies, and four hours to search online.

COMPUTER-ASSISTED INSTRUCTION

Several academic, governmental, and industrial organizations use computer-assisted instruction (CAI) to teach information consumers to search. CAI offers many advantages and can be extremely effective if:

- The online system is fairly stable, requiring minimal, if any, substantial changes
- Users are geographically dispersed
- Turnover rate is high
- There is a need to provide for variable learning rates
- Training loads fluctuate

- Scheduling training time is difficult for the user or for the training organization, or

- Tracking student progress is an important and time-consuming task[12]

One early use of CAI was an online training package developed at the University of Pittsburgh. "Hands-On Online in a Multi-System Multi-Database Trainer," or TRAINER, provides programmed instruction and practice for Dialog and Orbit users by emulating the systems.[13-15] Special programs allow users to practice the commands and search strategies unique to specific systems without going into the real systems.

TRAINER consists of nine modules. The first seven are tutorial, introducing commands and techniques. Modules eight and nine are system emulators of Dialog and Orbit, where participants can test their newly learned skills.

The Congressional Research Service began using CAI on a test basis in October 1980.[16,17] The course consists of:

- A one-hour overview of the SCORPIO system given by an instructor to a group of 12-20 users

- Individual instruction with the PLATO terminal

- Practice problems on the SCORPIO system

A CRS staff person is available during the training sessions. According to Griffith and Norton's reports, overall results were quite favorable. CRS plans to continue the PLATO instruction for at least another year.

Individualized Instruction for Data Access (IIDA) was developed by Drexel University and the Franklin Research Laboratories.[18] This system was designed to assist users in performing online bibliographic searches. It became operational in January 1979.

The system has two modes. The exercise mode consists of a "canned" exercise, a limited search, and advanced commands and strategy. The assistance mode is the normal operational mode. As the user searches, IIDA monitors the searches for errors or unproductive usages such as null sets, repetition of commands, unused sets, "thrashing," and "dwelling."

Landsberg and colleagues[19] also reported early use of IIDA at Exxon facilities. Research assistants helped in the training program, an expensive but necessary addition to the program.

TRANSPARENT SYSTEMS

An alternative to training information consumers in the use of complex online systems is the development of transparent systems allowing searchers to bypass an understanding of the specific differences of databases, systems, command languages, vocabularies, and access protocols.

Williams and Preece[20] reported on a project at the University of Illinois to design a Total Transparent Information Retrieval System (TTIRS). Marcus and colleagues[21] developed a Connector for Networked Information Transfer (CONIT) which translates user requests into the correct command language for any of several online systems.

Niehoff and colleagues[22-24] reported work on a Vocabulary Switching System (VSS) at Battelle's Columbus laboratories. The VSS assists the user by translating information requests into the database language of one or more target databases.

An interesting development in transparent systems is microDISCLOSURE. Available in January 1983, the microDISCLOSURE diskette allows a user to search the DISCLOSURE II database through Dialog on an IBM Personal Computer.[25]

MicroDISCLOSURE can perform the logon to the Dialog system and enter the user's password. Then a menu is displayed asking what companies or search criteria are desired. The microDISCLOSURE software converts the user's requests into the appropriate Dialog commands. Once searching is completed, output can be displayed in standard Dialog formats or saved on a diskette.

DISCLOSURE plans to develop similar capabilities for the Apple and TRS-80 microcomputers in 1983.

SIMPLIFIED SYSTEMS

Another alternative to teaching the information consumer to use a complex online system is to simplify the system. Dialog and BRS have recently introduced simplified after-hours systems.

Dialog's after-hours system, Knowledge Index (KI), is similar to the Dialog system, but commands are limited to BEGIN, FIND, EXPAND, PAGE, DISPLAY, RECAP, KEEP, AND ORDER. When two or more words are entered in a string, adjacency is assumed. Introduced in late 1982, KI is supported by a step-by-step workbook[26] and toll-free search assistance. Although no in-person training is planned at this point, according to Charles Meadow, other training techniques are being investigated.

BRS/After Dark is a simplified version of the BRS system. Like KI, After Dark allows the searcher to enter words in a string, and adjacency is assumed. Users are prompted at the end of each search with a list of instructions. After Dark is supported by the BRS/After Dark User's Manual[27] and toll-free search assistance. Currently, BRS has no plans for After Dark in-person training, says Cathy Anderson, Manager of the After Dark feature.

The development of KI and After Dark signals a new step in the process of moving toward information consumer searching. Two providers of complex online systems have chosen to develop simplified systems for information consumers rather than establish training programs for the existing complex systems.

OUTLOOK

The future holds a number of exciting challenges for the information industry. Rapid developments in software technology are making system commands simpler. Today, complex instructions are necessary to link a LEXIS terminal to the terminal user. Tomorrow such interactions will be invisible to the terminal user.

The major impact of such advanced software technology will be to make the communicating terminal a household concept. A desk will be incomplete without the electronic device permitting a professional to access information on the company's computer system and hundreds of others worldwide. Information is becoming a consumer product.

One of the principal tasks for database publishers, timesharing companies, and information specialists will be dealing with the confusion that comes with rapid change. More people than ever before will have a small amount of knowledge about the possibilities of online, but will need help in developing a thorough understanding of the systems. Moving them to this important level is the task of the future.

As this review of the literature suggests, the best way to teach online searching is to take people by the hand and show them how to search in an intimate and relaxed setting. This utopian view does not fit well with reality. It is costly to provide one-on-one or small group training. As a consequence, the explosion in the number of users means that training innovations are a necessity. For example:

- Videodisc technology linked to a microcomputer may help bring personal instruction to some information
- DISCLOSURE II's microDISCLOSURE diskette is one possible alternative to system-specific training
- The ONTAP-type concept positions training as a service to stimulate usage on a particular system
- Hardware manufacturers are working to make the automated office familiar and easy to use

There are many challenges ahead in assuring that information consumers develop a thorough understanding of online. The industry must begin to move from experimentation to implementation.

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